
Influence of Parents' Educational and Socio-Economic Status on Dental Health of Children Among South Indian Population

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Abstract: In the modern era where both parents are employed, there seems to be limited focus on the dietary habits and dental health of their children. Hence, the aim of this study was to assess the parental influence and family characteristics on the prevalence of dental caries among children who reported to the department of Orthodontics aged 10-17 years from Chennai. A cross-sectional epidemiological survey was carried out on 250 children aged 10 years to 17 years. The data was retrieved from the subjects records provided by the institution which consisted of information on their dental caries status. Structured questionnaires were given to parents to collect information regarding their socio-environmental and family characteristics. Student's t-test on metric parameters and Chi-square/Fisher for study parameters between two or more groups were used. It was observed that in families where the average monthly income >10,000/-, decayed, missing, and filled teeth was proportionately lower. The socioeconomic status, which is primarily influenced by parental factors and family structure, have a definite role in dental needs of children from underprivileged backgrounds. Dental health programs should aim to reduce the gross inequalities in the oral health status of these children and their families.

Keywords: defense Children, Dental health, Innovation, Parents' Education, Socio-economic status

INTRODUCTION

General health reflects an individual's health habits and general health behavior in various ways. Any modifications in their lifestyle can affect the overall oral health. Dental diseases are often connected with lifestyle's multiple risk factors which further affect the overall health.(Lisboa et al., 2013) (Alkarimi et al., 2012). Oral health is intrinsically linked to the individual's general health and quality of life (QOL), the impact is reflected in their days lost at school and work, difficulty with eating, reduced self-esteem, poor QOL, among other consequences.(Sheiham et al., 2011) (Paula et al., 2012)

Dental caries is one of the most prevalent chronic diseases in children worldwide and it is mostly untreated.(Sheiham et al., 2011). Dental caries are generally not life-threatening, but the consequences of untreated caries are very high, especially when the general and emotional health and treatment cost is considered.(Yee and Sheiham, 2002) (Horowitz, 2003) (Curzon and Preston, 2004). Untreated severe caries can lead to pulpitis and sepsis, sometimes causing serious complications such as cellulitis and brain abscesses.(Brook, 1995) Caries experience is often associated with poor child growth and low weight gain.(Ayhan, Suskan and Yildirim, 1996) (Oliveira, Sheiham and Bönecker, 2008) Increased treatment time and cost,(Simmer-Beck et al., 2011) higher risk of hospitalization, days missed from school and work and compromised school performance.(Pongpichit et al., 2008)

Dental hospitals play a significant role in promoting dental services for school children.(Watt, 2012) (Petersen and Kwan, 2011) (Castilho et al., 2013). This dental care model comprises preventive and curative interventions with the aim of promoting oral health among children and their families.(Lisboa et al., 2013)

Very little information is known about the differences in parental influence and family characterization between school children with and without curative dental treatment needs belonging to lower strata income groups, even though the influence of social determinants on oral health has been recognized in the literature. Our department is passionate about research we have published numerous high quality articles in this domain over the past years ((Kavitha et al., 2014) , (Praveen et al., 2001),(Devi and Gnanavel, 2014), (Putchala et al., 2013), (Vijayakumar et al., 2010), (Lekha et al., 2014a, 2014b) (Danda, 2010) (Danda, 2010) (Parthasarathy et al., 2016)

(Gopalakannan, Senthilvelan and Ranganathan, 2012), (Rajendran et al., 2019), (Govindaraju, Neelakantan and Gutmann, 2017), (P. Neelakantan et al., 2015), (PradeepKumar et al., 2016), (Sajan et al., 2011), (Lekha et al., 2014a), (Neelakantan, Grotra and Sharma, 2013), (Patil et al., 2017), (Jeevanandan and Govindaraju, 2018), (Abdul Wahab et al., 2017), (Eapen, Baig and Avinash, 2017), (Menon et al., 2018), (Wahab et al., 2018), (Vishnu Prasad et al., 2018), (Uthrakumar et al., 2010), (Ashok, Ajith and Sivanesan, 2017), (Prasanna Neelakantan et al., 2015). Thus, the objective of this study was to investigate the parental influence and family characterization of school children with and without curative dental treatment needs, from poor families participating in a dental health program. Our study centered on the following hypotheses.

MATERIALS AND METHODOLOGY

A cross-sectional study was conducted in Saveetha Dental College, Chennai. Prior permission was obtained from the college authorities for conducting the study.

Two hundred fifty school going children of both genders in the age group of 10-17 years who reported to the institution were chosen for the present study. A random sampling method was followed to choose the subjects for the study.

Inclusion criteria

- Children in the age group - 10-17 years
- Children and parents who were willing to participate in the study.

Exclusion criteria

- Children with compromised health.

Questionnaire

A specially designed questionnaire was used in the present study that had a set of 15 questions. The questions ranged from general questions on demographic information; number of siblings; any previous dental visit or oral health program; type, time and kind of toothpaste and brushes used; monthly household income; Parents qualification and job status etc. (Paula et al., 2012)

The questionnaire critically evaluated the following:

- Monthly household income - here a reference value of Rs. 10,000 international normalized ratio (INR) was taken as the baseline value.
- Parents Qualification and Employment:
 - Both parents were separately asked to record their status regarding educational qualification and employment. The parents were asked whether they were graduates or had they stopped their education midway.
 - Dwelling
 - Type of dwelling
 - Kind of living (nuclear/single family).

Examination procedure

All the subjects were clinically examined by one trained dentist under field conditions that included gloves, disposable mirrors and probes for every child. The study was performed under natural light, and the examination of caries was carried out in a systematic fashion using Federation Dentaire Internationale tooth numbering system. Caries experience was assessed using the decayed, missing, and filled teeth (DMFT)/dmft index according to the World Health Organization (World Health Organization, 2013) caries diagnostic criteria.

A tooth was diagnosed "sound" if there was no evidence of treated caries (filling) or untreated caries (decay), white chalky spots (incipient enamel lesion), staining, calculus or rough spots, a deep pit or fissure (stained or unstained) that was caught on the probe but had no detectable softened dentin floor, undermined enamel or softened walls, fluorosis or any questionable lesion which could not reliably be diagnosed as caries.

Confidentiality was maintained throughout the study and the collected data were subjected to statistical analysis. Student's t-test on metric parameters and Chi-square/Fisher for study parameters between two or more groups were used.

RESULTS AND DISCUSSION

The sample consisted of 41.6% male and 52.8% female subjects in the income group of <10,000/- , and 58.4% male and 47.2% females in the income group of >10,000/- (fig.2). As regards to the socioeconomic variables, 47.2% of families had an income ≤10,000 Rs. and 52.8% with income > 10,000/- (Fig.1).

A chi square association was done between parents and their income. Among males , 41.6% had income less than 10,000/- and 58.4% had income more than 10,000/-. Among females, 52.8% had income less than 10,000/- and 47.2% had income more than 10,000/-. Chi-square test was performed and it was found to be significant.

Pearson's chi-square value - 6.292, p value- 0.012($p < 0.05$) ; it was inferred that most of the mothers had an income of less than 10,000/- and majority of the fathers had an income of more than 10,000/-. This was found to be statistically significant.(p value:0.012) (Figure 2)

Children who brushed twice daily had lesser dental caries score compared to their counterparts ($P \leq 0.001$) and there was not a significant difference in using children or adults toothpaste ($P = 0.386$). Fathers (72.6%) and mothers (77.97%) are qualified above graduation and have an income of above 10,000/- and their children had lesser dental caries score ($P \leq 0.001$, $P \leq 0.001$). (Table 1,2,3 and figure 3).

Mostly 47.46% children in the <10,000/- income group and 49.24% in the >10,000/- income group used medium bristles. ($P < 0.001$) (Table 2)

An association was done between total income and the DMFT scores of the subjects. Chi-square test was performed and the association was found not to be significant . Pearson's chi-square value - 1.167, p value - 0.761; it was inferred that the DMFT scores was borderly lower in the >10,000/- income group compared to the <10,000/- income group; however this was not statistically significant ($p > 0.05$) (Table 3 and figure 3)

Previously our team had conducted numerous clinical trials (Sivamurthy and Sundari, 2016) (Samantha, 2017) (Krishnan, Pandian and Kumar S, 2015) (Vikram et al., 2017) (Kamisetty et al., 2015) (Viswanath et al., 2015) (Felicita, 2017b) and lab animal studies (Rubika, Sumathi Felicita and Sivambiga, 2015) (Jain, Kumar and Manjula, 2014) (Pandian, Krishnan and Kumar, 2018) (Ramesh Kumar et al., 2011) (Felicita, 2017a) and in-vitro studies (Felicita, Chandrasekar and Shanthasundari, 2012) (Dinesh et al., 2013) (Felicita and Sumathi Felicita, 2018). The results in the present study revealed that there are social inequalities in the oral health of school children, where researchers have emphasized the family environment and its conditions as mediators of health and disease in schoolchildren.(Watt, 2012) (Petersen and Kwan, 2011) (Castilho et al., 2013)

In the present study it was observed that, Children living in homes with a monthly family income of > Rs. 10,000/-, had less dental caries than their counterparts. (Table 3) Thus, even in underprivileged families, a deprivation gradient for dental caries was found. Mostly due to less access to broader and better health information fewer resources to buy and replace oral hygiene aids, and fewer favorable conditions to make healthier choices, including dietary choices and access to dental care.(Lisboa et al., 2013) In addition, psychological and social problems because of living in poverty, influencing the way parents care for their children.

Owning a House, an environmental living condition, improve the psychological well-being of homeowners and support better parenting practices, which may lead to better child outcomes even in disadvantaged families.(Grinstein-Weiss et al., 2010)

Family structures are changing globally and in Chennai, it has an impact on the oral health status, oral health-related QOL, and self-perceived oral health of children and adolescents. Underprivileged children living with both biological parents were a protective factor, as they presented dental caries than those in nonnuclear families. There is evidence that nuclear families were more likely to have a supportive economic and psychological environment for performing better health behaviors than the environment provided by single or separated parents. The latter are generally more stressed to earn enough income to sustain their children, resulting in negligent attitudes towards monitoring oral health and using dental services for both themselves and their children.(McGrath, Yeung and Bedi, 2002)

Telleen et al.(Telleen et al., 2012) pointed out that to encourage access to dental care for school children, it is necessary for mothers to incorporate the value of preventive and curative dental care into their children's upbringing, especially in vulnerable populations and mothers who believed that dentist's visits were for the purpose of keeping the child's teeth healthy and believed in the importance of dental visit were more likely to return to the dental office.

However, parental influence such as scheduling caregivers, transportation difficulties, fear of the dentist, provider availability, past satisfaction with dental care received, oral health beliefs, among other factors, could be a barrier that restrains/prevents the capacity of motivation from being transformed into action, impeding the access of low-income caregivers to oral health services for their children, and leading to them having a higher level of accumulated treatment needs.

Furthermore, dental screening at schools helps with the detection of normative dental treatment needs that are often not detected by the guardians. Such programs encourage access to dental care and awareness of both parents and children of the need for this, especially among low-income groups. Therefore, they are an essential requirement for tackling the oral health inequalities of children.

Evidence has shown that the availability of a regular source of dental care was a strong predictor of dental visits in the past 12 months, among persons in a vulnerable population. Thus, improving access to oral health services could allow standardization of the risk profile of children from different socio demographic backgrounds and act on children requiring urgent dental treatment, and on the number of decayed teeth.(Muirhead and Lawrence, 2011)

According to Acs's study,(Acs et al., 1999) it would be better for dental professionals to know the impact of socio environmental conditions and family structure on the oral health of individuals, in order to plan

intersectorial actions, which positively impact the health of populations in a sustainable manner, especially those who are most vulnerable. (Mattheus, 2010)

These study results are generalizable to healthy children with severe dental caries and without severe functional limitations enhance the community-based sampling. Limitations of this study is the amount of knowledge of parents of different socioeconomic status could have hampered the results of the questionnaire, and the wide age group of the sample and different dentition, may not give an unbiased result. The calculation of the sample size may not be appropriate as the estimation of the required number was calculated using expert opinion and an uncontrolled study in an industrialized country. Further it is a cross-sectional study, in which the causal relationship cannot be adequately assessed. Therefore, longitudinal follow-up is required for further insights into the reduction of inequalities in oral health of underprivileged school children.

CONCLUSION

The following conclusions were drawn from the present study:

- Parents who have attended dental programs and seen a dentist before had less dental caries score.
 - Children of parents having salary < 10,000/- INR had higher DMFT
- Our present study reflected relevant areas and it is here where the inequalities in oral health status and the means to access the same should be simplified for the common man thus positively impacting the QOL and more so the oral health in particular.

Author Contribution

Both the authors have equal contribution.

Conflict of Interest

There is no conflict of interest.

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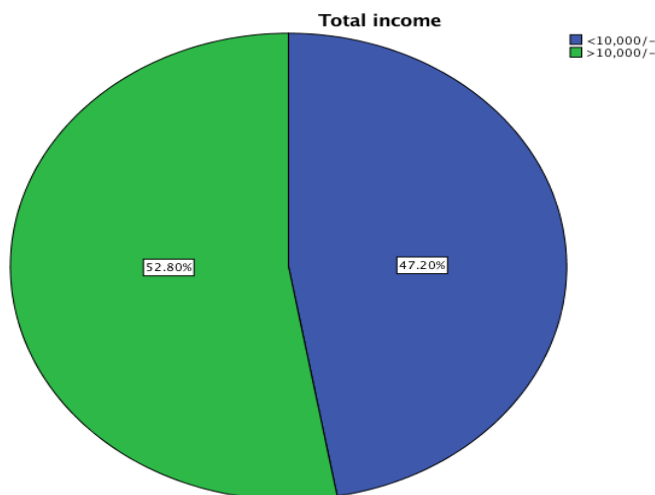


Fig.1: Pie chart showing percentage of income. The chart shows that 52.8% of the sample population had an income of more than Rs.10,000/- and 47.2% had less than Rs.10,000/-.

Table. 1: Sociodemographic variables of the study population. It was inferred that 58.4% of the fathers had a monthly income of >10,000/- and 52.8% of mothers had an income of <10,000/-. 72.6% of the fathers and 77.97% mothers who had an income of >10,000 had studied beyond graduation.

Sociodemographic Variables		Income <10,000 /- (total = 236)	Income >10,000/- (total = 264)
Gender			
	Fathers	104 (41.6%)	146 (58.4%)
	Mothers	132(52.8%)	118(47.2%)
Qualification			
Father	Above graduation	69(66.35%)	106(72.6%)
	Below graduation	35(33.65%)	40(27.4%)
Mother	Above graduation	78(59.09%)	92(77.97%)
	Below graduation	54(40.91%)	26(22.03%)

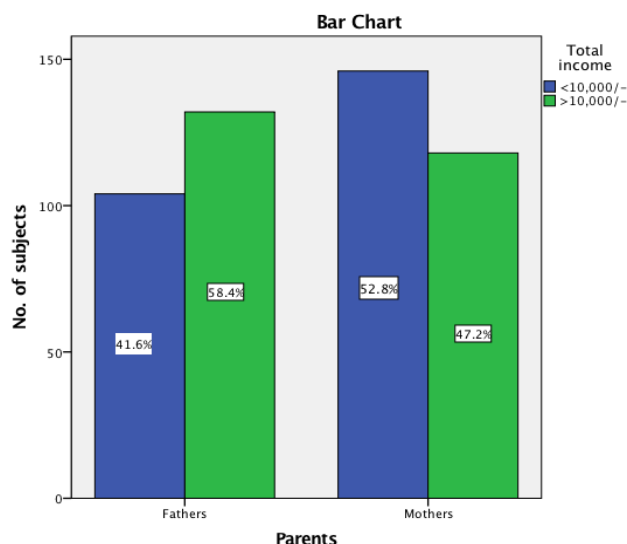


Fig.2: Bar chart representing the association between parents and their income. The X-axis represents the parents (fathers and mothers) and the Y-axis represents the number of subjects. Among males, 41.6% had income less than 10,000/- and 58.4% had income more than 10,000/-. Among females, 52.8% had income less than 10,000/- and 47.2% had income more than 10,000/-. Chi-square test was performed and it was found to be significant. Pearson's chi-square value - 6.292, p value- 0.012(p<0.05); it was inferred that most of the mothers had an income of less than 10,000/- and majority of the fathers had an income of more than 10,000/-. This was found to be statistically significant.(p value:0.012)

Table. 2. Oral Hygiene practices of dental population.

Descriptive analyses were performed to assess the frequency of dental visits and the oral hygiene practises between the two income groups. It can be inferred that the subjects in the income group of >10,000 visited the dental office more regularly. The oral hygiene practises of the subjects were also better in the >10,000 income group.

		Income <10,000 /- (total =118)	Income>10,000/- (total =132)
Regular Dental Visits			
	Yes	52(44.06%)	89(67.42%)
	No	66(55.94%)	43(32.58%)
No. of Brushing times per day			
	Once	93(78.81%)	86(65.15%)
	Twice	25(21.19%)	46(34.85%)
Tooth Paste			
	Adult Toothpaste	98(83.05%)	100(75.76%)
	Child Toothpaste	20(16.95%)	32(24.24%)
Type of toothbrush			
	Hard toothbrush	28(23.73%)	19(14.37%)
	Medium toothbrush	56(47.46%)	65(49.24%)
	Soft toothbrush	34(28.81%)	48(36.36%)

Table.3. Dental caries experience of the study population.

Descriptive analysis was performed and the percentage distribution of DMFT scores in both income groups were obtained. It was observed that the DMFT scores was borderly lower in the >10,000/- income group compared to the <10,000/- income group.

	Score	Income <10,000 /- (total= 118)	Income>10,000/- (total = 132)
DMFT			
	0	12(10.17%)	19(14.39%)
	1-2	51(43.22%)	52(39.39%)
	3-5	38(32.2%)	41(31.06%)
	>5	17(14.41%)	20(15.15%)

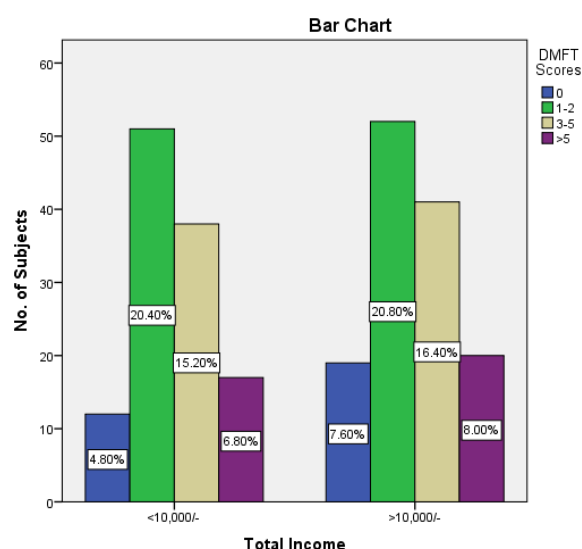


Fig.3: Bar chart representing the association between total income and the DMFT scores of the subjects. The X-axis represents the total income of the parents per month and the Y-axis represents the number of subjects . Chi-square test was performed and the association was found not to be significant . Pearson's chi-square value - 1.167, p value - 0.761; it was inferred that the DMFT scores was borderly lower in the >10,000/- income group compared to the <10,000/- income group; however this was not statistically significant (p>0.05)